jects exclusively connected with railways, no account of them is given. (3) Industrial schools with a course of general education not exceeding the scope of the course of primary schools, or sometimes reaching the standard of the second class in village schools with two classes. In most of them pupils are received who have completed the course in the public school, and who repeat what they have gone through in it. These schools are founded with the object of preparing skilled artisans for village and domestic industries, and also factory hands. They contain workshops for joiners, blacksmiths, carpenters, fitters, tailors, shoemakers, saddlers, bookbinders, &c.; but few of these institutions can boast of a systematic course of instruction in trades. (4) To this group belong various special and general educational schools for adults, as the school for foremen builders, the school for printers, the evening and Sunday special classes of the Imperial Technical Society at St. Petersburg, the Riga Industrial School, &c. The teaching in these institutions takes place in the evenings of week-days, and on Sundays, *i.e.* when the adult workmen for whom they are intended are free from their work. (5) This group consists of elementary schools of general education, *i.e.* primary, district, or municipal schools with supplementary industrial sections. It is worthy of notice that persons who have gone through the whole course, or at least reached a certain standard, at any of the schools of these five groups, enjoy certain privileges with regard to exemption from military service.

The report then goes on to describe in detail the courses of some of the leading industrial schools as types of the different groups, as well as of the industrial classes attached to the elementary schools. In conclusion, the report summarizes the more important provisions of the ukase of March 7/19, 1888, respecting the conditions under which technical and industrial schools may be opened in Russia, either wholly or in part, at the expense of the State (given in Appendices I., II., III.). The cost of maintenance of these schools is respectively estimated in the ukase as follows: the intermediate mechanical technical schools at 27,311r. (£2730) per annum; the elementary mechanical technical schools at 19,436r. (£1945) per annum; and the trade schools at 11,960r. (£1200) per annum. The Ministry of Education has assigned for this year the sum of £50,000 for the creation of these technical schools, and it is reported that the Ministry has been urged to devote a considerable portion of this sum to founding schools in the districts where village industries prevail, the richer manufacturing districts being better able to dispense with State aid. The provisions of the ukase are:—(1) The industrial schools for the male inhabitants of the Empire exist for the purpose of diffusing among the population technical education of the intermediate and elementary standards, as well as instruction in handicrafts. (2) The intermediate technical schools impart the instruction and skill indispensable to artificers who are destined in time to act as the trusted assistants of engineers and of other managers of industrial enterprises. (3) The elementary technical schools, besides initiation into the mysteries and methods of some one definite handicraft, likewise impart the knowledge and skill indispensable to men whose duty it will in time become to act as master-workers and immediate overseers of the operations of artisans in industrial establishments. (4) The trade schools exist for the purpose of giving practical tuition in the methods of any one trade, and at the same time of communicating such knowledge and skill as are absolutely necessary to the intelligent execution of the work of such trade. (5) Industrial schools of each of the above-mentioned categories can exist either apart or in conjunction with other similar schools of various degrees and specialities. (7) The industrial schools are supported at the expense of the Crown, or of the *zemstvos*, societies, guilds, or private individuals, or by funds contributed simultaneously from all these sources. (8) The course in the intermediate technical schools is not to exceed four years; that of the elementary and trade schools three years. (9) Those who enter trade schools are required to produce a certificate of their having gone through the course of an elementary school; those who enter the elementary technical schools, a certificate of having gone through the course in a municipal school, or village school, with two classes; while those who enter intermediate technical schools must have gone through five classes of a *Realschule*. (10) Those who are unable to satisfy the conditions mentioned in the preceding paragraph, but who have worked not less than two years in industrial institutions, and have proved that they can successfully follow the course at the school they wish to enter, may be also admitted. (11) Industrial schools must have: (*a*) a library, (*b*) a room with appliances for geometrical and freehand drawing, (*c*) where possible a room with appliances for modelling, (*d*) the necessary school books for the special object for which the school is intended, and in addition the requisite appliances for the practical work of the apprentices. (14) Pupils who have successfully completed their education in an intermediate technical school, after a four years' course, receive the appellation of artificer in their specific calling. Those who have only gone through a two or three years' course, only receive this appellation after three or two years respectively, spent uninterruptedly in industrial work. Those who are so styled obtain certain privileges as regards their civil status and in respect to military service, and they enjoy in addition the right of entering the higher technical schools. Those who have completed the course at the other two categories of schools enjoy the privileges as regards civil status and military service which correspond to the general education they have received.

FOSSIL FISH OF THE SCANDINAVIAN CHALK.

MR. DAVIS has availed himself of the opportunities presented to him by the chief officers of the Museums of Lund, Stockholm, and Copenhagen, and has published a monographic account of the fish remains from the Cretaceous formations of Scandinavia.

Over seventy years ago Sven Nillson first discovered fish remains in the Swedish chalk. Since then numerous large collections have been made by the officers of the Geological Survey of Sweden and others, and the greater number of these specimens were unreservedly placed at the disposal of Mr. Davis for description in his memoir; he has also had the opportunity of consulting some smaller collections in Sweden, and most of the forms have been figured from the original specimens by Mr. Crowther.

These fish remains show a closer relationship to the Cretaceous fish remains of the north of Europe, as represented by the English and French chalk fish, than to the more highly specialized chalk fauna of Asia Minor, but they do not afford representatives of several of the Physostomous Teleosteans, such as Ichthyodectes, Protosphyræna, and Pachyrhizodus, which have been found in the English chalk, and have also occurred in the Upper Cretaceous rocks of North America.

The great majority of the fish remains are Selachian, and comprise twenty-four species. Of these, *Carcharodon rondeletii*, *Otodus obliquus*, and *Odontaspis acutissimus* are regarded as indicating a Tertiary fauna, but in the Scandinavian chalk they have been found asoociated with many undoubted Cretaceous forms in the Faxe limestone or chalk. The character and extent of this fauna indicates conditions very similar to those accompanying the deposition of the English and French chalk and of that of Central Europe generally, whilst it affords comparatively few data for comparison with that of Lebanon. The occurrence of numerous teeth of several species of Scapanorhynchus in the Swedish area is worthy of note, but the fish are not found preserved bodily as they are in the chalk of Lebanon.

This memoir is published as Part vi. of vol. iv. of the Transactions of the Royal Dublin Society, and is illustrated with an atlas of nine plates.

SOCIETIES AND ACADEMIES.

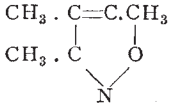
LONDON.

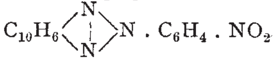
Royal Society, May 28.—"On the Bases (Organic) in the Juice of Flesh. Part I." By George Stillingfleet Johnson, M.R.C.S., F.C.S., F.I.C. Communicated by Prof. G. Johnson, F.R.S.

The author has endeavoured to ascertain by careful experiments how far the substances hitherto prepared from flesh are true "*educts*," and really present in the flesh itself, or merely products, due to (1) the action of chemical or physical agencies applied in the course of extraction, or (2) to bacterial action modifying the composition of the flesh before it comes into the hands of the operator.

The final conclusion drawn is that sarcous kreatine is not present in fresh muscle, but results from bacterial action whereas sarcous kreatinin is probably a true "educt."

Chemical Society, May 7.—Dr. J. H. Gladstone, F.R.S., Vice-President, in the chair.—The following papers were read:—The action of alkalis on the nitro-compounds of the paraffin series, by W. R. Dunstan and T. S. Dymond. The paper contains the results of further investigation of the interaction of alkalis and nitroethane, of which a preliminary account has already been given (Chem. Soc. Proc., 1888, p. 117). Nitroethane and alkali carbonates in the cold interact to yield carbon dioxide, and the alkali derivative of nitroethane, which is obtained when alkali hydroxide is employed. Ammonia combines with nitroethane in the cold to form a crystalline compound, analogous to the potassium and sodium derivatives. The action of alkalis proceeds further on warming, and there are formed alkali nitrite, acetonitrile, and a compound, boiling at 171°, and solidifying to a crystalline mass when cooled to 3°·5. The authors find that this compound is trimethylisoxazole



It is very stable, and is almost unaffected by heating in closed tubes with strong acids and alkalis. Permanganate oxidizes it to acetic acid, and nitric acid to acetic and oxalic acids. By reducing-agents it is slowly decomposed with formation of ammonia, acetic acid, and secondary butyl alcohol. By the action of sodium on a well-cooled moist ethereal solution, a *dihydride* $C_6H_{11}NO$ (m.p. 110°) is formed, which, when heated with water, is decomposed into ammonium acetate and ethyl methyl ketone. The *mercurichloride* has the formula $C_6H_9NO, HgCl_2$, and the *aurichloride* the formula $C_6H_9NO, AuCl_3$. Nitropropane, when acted on by alkalis, yields triethylisoxazole, propionitrile, and alkali nitrite, but the reaction occurs with greater difficulty than in the case of nitroethane. Nitromethane is readily acted on by alkalis, and hydrogen cyanide, alkali nitrite, and much resin are formed. The parent isoxazole could not be isolated. Secondary nitropropane is attacked with difficulty by alkalis, and no isoxazole is formed.—Some new addition compounds of thiocarbamide which afford evidence of its constitution, by J. E. Reynolds, F.R.S. Thiocarbamide combines with ammonium bromide, iodide, and chloride at the temperature of boiling alcohol, and forms compounds of the type $(H_4N_2CS)_4H_4NR'$. Under the conditions specified no compounds were obtained containing less than four molecular proportions of the amide to one of the ammonium haloid salt. Methyl-, ethyl-, allyl-, phenyl-, diphenyl-, and acetylphenyl-thiocarbamides do not yield compounds with ammonium bromide at the temperature of boiling alcohol. Thiocarbamide and tetrethylammonium bromide and iodide yield compounds of the type $(H_4N_2CS)_2Et_4NR'$. Under the experimental conditions, no well-defined substance was obtained containing more than two molecular proportions of the amide to one of the tetrethylammonium salt. Thiocarbamide and diethylammonium bromide form the compound $(H_4N_2CS)_3Et_2H_2NBr$. Thiocarbamide, when treated with triethylammonium bromide yields a mixture of the two compounds $(H_4N_2CS)_3Et_3HNBr$ and $(H_4N_2CS)_2Et_3HNBr$. With methylammonium bromide the amide forms the compound $(H_4N_2CS)_4MeH_3NBr$. It does not, however, combine with ethylammonium bromide, and when heated with the salt in the molecular proportions 4 : 1 at 135° in a sealed tube, together with alcohol, it yielded ethyl oxide and tetrathiocarbamidammonium bromide. The author points out that these facts supply evidence against the symmetrical constitution of thiocarbamide $CS(NH_2)_2$, and altogether in favour of the unsymmetrical constitution $HN:C(SH)NH_2$.—The action of acetic anhydride on substituted thiocarbamides; and an improved method for preparing aromatic mustard oils, by E. A. Werner, Trinity College, Dublin. The action of acetic anhydride on diphenyl-, ortho-, meta- and para-ditolyl-, meta-dixylyl-, dibenzyl- and diethyl-thiocarbamides has been studied. In the case of the aromatic derivatives, no acetylated derivatives of the thiocarbamides were produced. The solution of the thiocarbamide in acetic anhydride is accompanied by simultaneous decomposition into "anilid" and mustard oil in accordance with the equation $CS(NHR)_2 + (CH_3CO)_2O = CH_3CONHR + R.NCS + CH_3COOH$. When the solution is heated for five minutes at the boiling-point of acetic anhydride, an almost theoretical yield of mustard oil is obtained. Prolonged heating produces a secondary reaction expressed by the equation $R.NCS + CH_3COOH = CH_3CONHR + COS$. In the case of fatty thiocarbamides a well-defined acetylated thiocarbamide is first produced, and prolonged heating gives rise to the formation of mustard oil, but the yield of the latter is never high, and as final product a substituted amide is produced.—The decomposition of silver chloride by light, by A. Richardson. When pure silver chloride is exposed to light under water oxygen is evolved, part of which is present as ozone; when small quantities of water are present, chlorine and hydrogen chloride are found in solution; with large quantities of water, hydrogen chloride, but no chlorine, is found. The influence of hydrogen chloride in retarding the decomposition of silver chloride is considered, and is explained from experimental results given, which show that even minute quantities of hydrogen chloride exercise a marked influence on the stability of chlorine water when exposed to light, the rate of decomposition of the silver chloride being dependent on the readiness with which the chlorine in solution and water interact to form hydrogen chloride. The author describes experiments which show that the darkened product obtained by exposure of silver chloride to light contains no oxygen, and he concludes that it is of the nature of a sub-chloride rather than an oxychloride.—The addition of the elements of alcohol to the ethereal salts of unsaturated acids, by T. Purdie and W. Marshall. The authors record the results of experiments on the addition of the elements of alcohol to ethereal salts of fumaric and maleic acids by the agency of small quantities of sodium alkylate; they also describe a series of experiments with other ethereal salts, the object of which was to ascertain if the ethereal salts of unsaturated acids in general are capable of undergoing the same additive change. By the action of a small quantity of sodium methylate in the cold, on a mixture of methylic alcohol and methylic fumarate, an almost theoretical yield of methylic methoxysuccinate is obtained. Methyl fumarate, on heating with alcoholic sodium methylate, yielded a compound of the formula $C_{11}H_{12}O_7$, formed by the abstraction of 3 mols. of methyl alcohol from 2 mols. of methylic methoxysuccinate. Under similar conditions methylic amylate gave methylic methylpropionate. Methylic and ethylic crotonate gave methylic methoxybutyrate and ethylic ethoxybutyrate. The authors think that the alkyloxy-group attaches itself to the β-carbon atom. Ethylic methacrylate also formed additive compound; but pure products were not obtained from the reaction. Ethylic angelate, ethylic allylacetate, methylic and ethylic cinnamate and ethylic *o*-(β) ethylcumarate do not undergo additive change.—Notes on the azo-derivatives of β-naphthylamine, by R. Meldola, F.R.S., and F. Hughes. The authors have completed the series of azo-derivatives obtainable from the nitranilines and β-naphthylamine by preparing orthonitrobenzene azo-β-naphthylamine. The latter by the action of nitrite in a warm acetic acid solution gives orthonitrobenzeneazo-β-naphthol. In cold acetic acid solution the naphthyl acetate is formed. Acetyl derivatives of the ortho-, meta-, and para-nitroazo-derivatives of β-naphthylamine have also been prepared. The pseudazimides from the para- and metanitro-compounds have been prepared. These compounds have the formula  $C_{10}H_6{<}\overset{N}{\underset{N}{\vdots}}{>}N\,.\,C_6H_4\,.\,NO_2$ (*p* or *m*). The action of aldehydes on these β-naphthylamine azo-derivatives gives rise to the formation of triazines, which are being investigated.—A method for the estimation of nitrates, by G. McGowan, Ph.D. This estimation is based on the interaction $HNO_3 + 3HCl = NOCl + Cl_2 + 2H_2O$. The gaseous products are led into a solution of potassium iodide.—New benzylic derivatives of thiocarbamide, by A. E. Dixon, M.D. A re-examination of "monobenzyl-thiocarbamide" has shown that the substance hitherto bearing this name is benzylamine thiocyanate; the latter can be converted into the isomeric thiocarbamide by heating for a short time at 150°–160°. The author describes a great number of benzylic derivatives of thiocarbamide.

Linnean Society, May 24.—Anniversary Meeting.—Prof. Stewart, President, in the chair.—The Treasurer presented his Annual Report duly audited, and the Secretary having announced the elections and deaths during the past twelve months, the usual ballot took place for new members of Council, when the following were elected: Messrs. C. B. Clarke, G. B. Howes, Arthur Lister, St. G. Mivart, and F. W. Oliver. The President and officers were re-elected. The usual formal business having been transacted, the President proceeded to deliver his annual address, taking for his subject "The Secondary Sexual Characters of Animals and Plants," of which he gave several interesting examples, illustrating his remarks with graphic sketches in coloured chalks. On the motion of Mr. H. Druce, seconded by Mr. C. Tyler, a vote of thanks was accorded to the President for his able address, with a request that he would allow it to be printed.—The Linnean Society's Gold Medal for the year 1891 was then formally awarded to Dr. Edouard Bornet, of Paris, for his researches in botany, and on his behalf was presented to M. Raymond Lecomte, Secretary to the French Embassy. The proceedings then terminated.

Institution of Civil Engineers, May 26.—Annual General Meeting.—Sir John Coode, K.C.M.G., President, in the chair.—In the Report of the Council for the session 1890–91, it was remarked that the salient feature of the session, now terminated, had been the realization of a proposal made more than forty years ago—namely, the formal reception by the President and Council on stated evenings after the ordinary meetings of the members and visitors then present. A series of receptions was held after the ordinary meetings in the months of January, February, March, April, and May, of this year. An endeavour has also been made to identify, in some degree, each gathering with a particular branch of engineering, both in respect to those invited to be present and to the models and other objects of interest exhibited. These receptions were believed to have been most successful, and experience would doubtless suggest directions in which they might be rendered still more useful and attractive in the future. The effective increase in the roll of the Institution during the past year was 247. The number of members of all classes, students excepted, on March 31 last, was 5150, as against 4903 on the same day last year, representing an increase at the rate of 5 per cent.—The adoption of the Report was moved, seconded, and carried, and it was ordered to be printed in the Minutes of Proceedings. Cordial votes of thanks were then passed to the President, to the Vice-Presidents and other Members of the Council, to the Auditors, to the Secretaries and Staff, and to the Scrutineers.—The ballot for Council resulted in the election of Mr. George Berkley as President; of Mr. H. Hayter, Mr. A. Giles, M.P., Sir Robert Rawlinson, K.C.B., and Sir Benjamin Baker, K.C.M.G., as Vice-Presidents; and of Mr. W. Anderson, D.C.L., Mr. J. Wolfe Barry, Mr. E. A. Cowper, Sir Jas. N. Douglass, F.R.S., Sir Douglas Fox, Mr. J. Clarke Hawkshaw, M.A., Mr. Charles Hawksley, Sir Bradford Leslie, K.C.I.E., Mr. George Fosbery Lyster, Mr. J. Mansergh, Sir Guilford Molesworth, K.C.I.E., Mr. W. H. Preece, F.R.S., Sir E. J. Reed, K.C.B., F.R.S., M.P., Mr. W. Shelford, and Mr. F. W. Webb as other Members of the Council.—The session was adjourned until the second Tuesday in November, at 8 p m. [At the first meeting of the newly-elected Council, the following officers were re-appointed: Mr. H. L. Antrobus, as Treasurer; Dr. Wm. Pole, F.R.S., Honorary Secretary; and Mr. James Forrest, the Secretary.]

EDINBURGH.

Royal Society, May 4.—Sir Douglas Maclagan, President, in the chair.—A preliminary note by Mr. John Aitken, on a method of observing and counting the number of water particles in a fog, was communicated. The phenomena which are denoted by the names fog, mist, and rain, differ merely in degree, and not in kind. In a haze dry dust particles are present in the air to a greater or less extent. The haze turns into a fog when water vapour is condensed upon the particles, and the fog will develop into mist upon the condensation of a sufficient amount of moisture. So that we may regard an ordinary fog and a mist as a dry fog and a wet fog respectively. The water drops in a fog will gradually settle upon the exposed surfaces of bodies. Hence it might seem that, in order to determine the extent to which moisture is present in a fog, it would be sufficient to allow the drops to fall upon a piece of mirror, which they would soon wet. But Mr. Aitken has found that when exposed surfaces are quite dry, a great quantity of water drops are often present in the air. The drops are exceedingly small and evaporate with great rapidity from the surfaces (heated by radiation) upon which they fall. The instrument which Mr. Aitken has adopted for the purpose of determining whether or not water drops are present is essentially identical with his pocket-dust counter. It consists of a glass micrometer divided into squares of a known size, a spot mirror for illuminating the stage, and a strong lens or a microscope for observing the drops on the stage. It is found convenient to observe an area of the stage equal to about 1/16th or 1/20th square centimetre when working with a magnifying lens. In one fog which was observed, objects at a greater distance than 100 yards were quite invisible, and the surfaces of exposed objects were quite dry. The number of drops which fell per minute varied greatly, sometimes reaching 3000 per square centimetre, sometimes only 300 per square centimetre. Two days later the same apparent external conditions regarding fog again obtained, and the number was found to be 1300 per square centimetre per minute—which remained fairly constant until the fog began to clear off when it slowly diminished. In both cases the observation was made at 10 a.m. If the stage be slightly heated, the drops never reach the surface but evaporate in the layer of heated air over it. Mr. Aitken has also modified this apparatus in order to admit of the counting of the number of drops which fall from a column of air of known height. A low power microscope is used, and so a column of air 5 centimetres long can be obtained over the stage. Underneath, and concentric with the microscope, a tube 5 centimetres long and 4 centimetres in diameter is mounted. The top and bottom of this tube can be simultaneously closed by covers which turn on an axis parallel to the axis of the tube. A micrometer, illuminated by a spot mirror, is fixed in the centre of the bottom, and, in the centre of the upper cover, a small opening which corresponds to the lens of the microscope is made. The former instrument may be used to observe the larger particles of dust in the atmosphere.—Dr. J. M. Macfarlane read a paper, illustrated by lantern demonstrations, on a comparison of the minute structure of plant hybrids with that of their parents. He finds that the minute structure of the hybrid, like the larger features, is always intermediate in character between the corresponding structures of the parents.

PARIS.

Academy of Sciences, May 25.—M. Duchartre in the chair.—Researches on the camphene series, by MM. Berthelot and Matignon.—Researches on the vapour-tension of saturated water-vapour at the critical point, and on the determination of this critical point, by MM. Cailletet and Colardeau. In a recent note (*Comptes rendus*, vol. cxii. p. 563, 1891) the authors communicated to the Academy a new method for determining critical temperatures and pressures. They now give the results obtained in the case of water. Six series of experiments with different weights of water indicate that the critical temperature is 365° C., the critical pressure which corresponds to this being 200·5 atmospheres.—On the analysis of the sunlight diffused by the sky, by M. A. Crova. If B be the intensity of the blue light diffused by the sky, and S the intensity of incident sunlight, it may be shown that $\frac{B}{S} = 100\left(\frac{565}{\lambda}\right)^n$, where 565 represents the wave-length of the maximum light intensity of the spectrum, and n is an empirical coefficient. M. Crova calculates values with $n = 4$ and $n = 4·5$, and finds that, although Lord Rayleigh's observations (*Phil. Mag.*, 1871, p. 107) are best in accord in the former case, his own observations at Montpellier give results which are better represented when the latter value of n is used.—On the relative age of the Quaternary stratum of Mont Dol (Ille-et-Vilaine), by M. Sirodot. The author's observations lead him to believe that the *débris* on Mont Dol belongs to an epoch anterior to the movement which in Quaternary times elevated the coasts of certain regions of the Baltic Sea.—On the exact determination of the glycolitic power of the blood, by M. R. Lépine and Barral.—Observation of the passage of Mercury across the sun's disk on May 9, 1891, made with the Plœssl equatorial at the National Observatory of Athens, by M. D. Eginitis. The internal contact of egress occurred at 18h. 17m. 20s., and external contact at 18h. 22m. 0s. (Athens mean time). The irradiation phenomenon known as the "black drop" was not observed.—The atmospheric conditions of Greenwich with regard to the universal hour question, by M. Tondini. The cloudy state of the Greenwich sky, and the many rainy days recorded at the Observatory, are adduced as arguments against the adoption of Greenwich as the prime meridian. The meridian of Jerusalem-Nyanza is said to possess numerous atmospheric and other advantages.—On the algebraic integration of differential equations of the first order, by M. Painlevé.—On the determination of the integrals of equations from derived partials of the first order, by M. J. Collet.—On Abelian equations, by M. A. Pellet.—Researches in thermo-electricity, by MM. Chassagny and Abraham.—Determination of the solar constant, by M. R. Savélief. From an actinometric curve obtained on December 26, 1890, the author obtains for the solar constant, reduced to the mean distance of the sun from the earth, the value 3·47 calories. Langley's value, from his Mount Witney observations, was 3·0 calories.—On the fluctuations in the heights of lake waters, by M. P. du Boys. In lakes, and particularly in the Lake of Geneva, the surface of water regularly rises in one part and lowers in another, performing an oscillatory movement. The region where the level is practically constant is called the node, and the movements referred to go by the name of *seiches*. The author investigates this wave-motion mathematically.—On a new portable sounding-apparatus of steel wire, by M. Émile Belloc.—Study of the barometric gradient, by M. G. Guilbert. Some remarkable relations between the force of the wind and the barometric gradient are given.—Relation between atomic weight and the density of liquids, by M. Al. Moulin.—On the sub-chloride of silver, by M. Guntz. Under the action of heat, the sub-chloride decomposes into silver and silver chloride. This decomposition is easily seen by the change of colours of the sub-chloride. Dilute nitric acid has absolutely no action upon the compound. With hot concentrated nitric acid, chloride of silver mixed with the sub-chloride is obtained. Potassium cyanide rapidly dissolves the compound, and decomposes it. Utilizing this reaction, the author has found that a given weight of chlorine disengages practically the same amount of heat (29 calories), when combining with Ag as when combining with Ag_2.—Action of potassium salts upon the solubility of potassium chlorate, by M. Ch. Blarez.—Electrolysis of the fused salts of boron and silicon, by M. Adolphe Minet. Some interesting experiments indicate that, by the electrolysis of white and red bauxites, it is possible to produce a series of alloys of iron, silicon, and aluminium, and, at the end of the operation, to obtain aluminium chemically pure.—On two new crystalline compounds of platinic chloride with hydrochloric acid, by M. Léon Pigeon. The compounds described have the composition $PtCl_4 . 2HCl . 4H_2O$ and $PtCl_4 . HCl . 2H_2O$.—On salicylate of bismuth, by M. H. Causse.—On the heat of solution and the solubility of some bodies in methyl-, ethyl-, and propyl-alcohols, by M. Timofeiew.—On the Stelleridæ found in the Bay of Biscay, at the Azores, and Newfoundland during the scientific expeditions of the yacht *Hirondelle*, by M. Edmond Perrier.—On the equivalence of the bundles in vascular plants, by M. P. A. Dangeard.—On the trappean formation of Toungouska Pierreuse, Siberia, by M. K. de Kroustchoff.—Researches on the elimination of oxide of carbon from the system, by M. L. de Saint-Martin.

MELBOURNE.

Royal Society of Victoria, March 12.—The following officers were elected for the year 1891:—President: Prof. Kernot. Treasurer: C. R. Blackett. Secretaries: H. K. Rusden and Prof. W. Baldwin Spencer.—The following papers were read:—A new species of Dictyonema, by T. S. Hall.—A preliminary account of *Synute pulchella*, by Arthur Dendy. This is a new genus and species of calcareous sponge, which is allied to Ute, but in which the individuals are fused together into a common mass.—The geology of the southern portion of the Moorabool valley, by T. S. Hall and G. B. Pritchard.

April 9.—On the occurrence of the genus Belonostomus in the Rolling Downs formation (Cretaceous) of Central Queensland, by R. Etheridge, Jun., and Arthur Smith Woodward, of the British Museum. This is described as a new species, under the name of *Belonostomus sweeti*.—Note on a new genus of Chætopod worm parasitic on a sponge of the genus Rhaphidophlus from Port Phillip, by Prof. W. Baldwin Spencer. The worm is remarkable in having the dorsal surface covered with a series of rows of setæ, each row enclosed in a membranous web, the bunches of setæ on the feet are also enclosed in webs.

GÖTTINGEN.

Royal Academy of Science.—In the Journal of the Scientific Academy of Göttingen, the following papers of scientific interest appear (July to December, 1890):—

July.—Fr. Pockels: On the interference phenomena of convergent homogeneous polarized light through twin-plate uniaxal crystals.—Voigt: Determination of the elastic constants of Brazilian tourmaline.

August.—Julius Weingarten: On particular integrals of Laplace's equation, and a class of fluid motions connected with the theory of minimum surfaces.—Venske: A modification of Hermite's first proof that *e* is transcendental.—Riecke: Special cases of equilibrium of a system having several phases.—Meyer: Discriminants and resultants of singularity equations (second notice).—Burkhardt: An equation in the theory of the theta-functions.—Klein: On the zero-points of the hypergeometric series.

October.—Nernst: On the distribution of a substance between two solvents.

December.—Riecke: The thermal potential of weak solutions. On electricification by friction.—Meyer: On discriminants and resultants of singularity equations (third notice).—Voigt: On the vibrations of strings.—Riecke: Molecular theory of diffusion and electrolytic conduction.—Hurwitz: On the zero points of the hypergeometric series.—Voigt: Determination of the constants of elasticity of several non-crystalline minerals.—Auerbach: On hardness and its absolute measurement.

STOCKHOLM.

Royal Academy of Sciences, May 13.—The elements of the hydrography of the Kattegatt and Skagerack, by Prof. O. Pettersson.—Studies on the Solenogastres; i. monograph of *Chætoderma nitidulum*, by Dr. A. Wirén.—Researches on the fossil wood of Sweden, by Dr. Conwentz, in Danzig.—Prof. S. Lovén gave a report on the work executed during the last summer at the zoological station of Kristineberg in Bohuslän, Sweden, and reviewed a paper by Dr. C. Aurivillius on the symbiosis between Pagurus and Hydractinia as well as another by Dr. Wirén on *Chætoderma nitidulum*.—Researches and observations on the method of Koch in treating tubercular diseases by Prof. Bruzelins.—A copper-plate engraving of a map of the world made in the beginning of the fifteenth century, formerly belonging to the museum of Cardinal Borgia in Velletri, described by Baron A. E. Nordenskiöld.—Studies on the brain of teleosteous fishes, by Herr G. Andersson Malme.—A final contribution to the flora of the Chlorophyllophysæ of Siberia, by Herr O. F. Borge.—On phen-ethyl-propyl and phenyliso-propyl-triazol combinations by Dr. T. A. Bladin.—On the specific heat of water between 0° and + 40°, by Herr A. M. Johansson.—A few formulæ to calculate the mortality among annuitants of public offices and private societies by Dr. G. Enström.—A comparison between the methods of Ångström and Neuman for determining the conductibility of heat in bodies; ii. experimental researches, by Dr. Hagström.—Hydrographical researches in the Gullman fiord during the summer of 1890, by Miss A. Palmqvist.

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